

ZyAIR 100

Wireless PC Card

User's Guide

Version 1.0

March, 2002

ZyXEL

TOTAL INTERNET ACCESS SOLUTION

Copyright

Copyright © 2002 by ZyXEL Communications Corporation.

The contents of this publication may not be reproduced in any part or as a whole, transcribed, stored in a retrieval system, translated into any language, or transmitted in any form or by any means, electronic, mechanical, magnetic, optical, chemical, photocopying, user's guide, or otherwise, without the prior written permission of ZyXEL Communications Corporation.

Published by ZyXEL Communications Corporation. All rights reserved.

Disclaimer

ZyXEL does not assume any liability arising out of the application or use of any products, or software described herein. Neither does it convey any license under its patent rights nor the patent rights of others. ZyXEL further reserves the right to make changes in any products described herein without notice. This publication is subject to change without notice.

Trademarks

Trademarks mentioned in this publication are used for identification purposes only and may be properties of their respective owners.

Federal Communications Commission(FCC) Interference Statement

This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operations.

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

If this equipment does cause harmful interference to radio/television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Information for Canadian Users

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operation and safety requirements. The Industry Canada does not guarantee that the equipment will operate to a user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly. The customer should be aware that the compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

For their own protection, users should ensure that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution

Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

Note

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the radio interference regulations of Industry Canada.

ZyXEL Limited Warranty

ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two years from the date of purchase. During the warranty period and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its discretion, repair or replace the defective products or components without charge for either parts or labor and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal value and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product is modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.

Note

Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. ZyXEL shall in no event be held liable for indirect or consequential damages of any kind of character to the purchaser.

To obtain the services of this warranty, contact ZyXEL's Service Center; refer to the separate Warranty Card for your Return Material Authorization number (RMA). Products must be returned Postage Prepaid. It is recommended that the unit be insured when shipped. Any returned products without proof of purchase or those with an out-dated warranty will be repaired or replaced (at the discretion of ZyXEL) and the customer will be billed for parts and labor. All repaired or replaced products will be shipped by ZyXEL to the corresponding return address, Postage Paid (USA and territories only). If the customer desires some other return destination beyond the U.S. borders, the customer shall bear the cost of the return shipment. This warranty gives you specific legal rights and you may also have other rights that vary from state to state.



Online Registration

Do not forget to register your Prestige (fast, easy online registration at www.zyxel.com for free future product updates and information.

Customer Support

Please have the following information ready when you contact customer support.

- Product model and serial number.
- Warranty Information.
- Date that you received your device.
- Brief description of the problem and the steps you took to solve it.

METHOD LOCATION	E-MAIL SUPPORT/SALES	TELEPHONE/FAX	WEB SITE/ FTP SITE	REGULAR MAIL
WORLDWIDE	support@zyxel.com.tw sales@zyxel.com.tw	+886-3-578-3942 +886-3-578-2439	www.zyxel.com www.europe.zyxel.com ftp.europe.zyxel.com	ZyXEL Communications Corp., 6 Innovation Road II, Science- Based Industrial Park, HsinChu, Taiwan 300, R.O.C.
NORTH AMERICA	support@zyxel.com sales@zyxel.com	+1-714-632-0882 800-255-4101 +1-714-632-0858	www.zyxel.com ftp.zyxel.com	ZyXEL Communications Inc., 1650 Miraloma Avenue, Placentia, CA 92870, U.S.A.
SCANDINAVIA	support@zyxel.dk sales@zyxel.dk	+45-3955-0700 +45-3955-0707	www.zyxel.dk ftp.zyxel.dk	ZyXEL Communications A/S, Columbusvej 5, 2860 Soeborg, Denmark.
AUSTRIA	support@zyxel.at sales@zyxel.at	+43-1-4948677-0 +43-1-4948678	www.zyxel.at ftp.zyxel.at	ZyXEL Communications Services GmbH. Thaliastrasse 125a/2/2/4 A-1160 Vienna, Austria
GERMANY	support@zyxel.de sales@zyxel.de	+49-2405-6909-0 +49-2405-6909-99	www.zyxel.de	ZyXEL Deutschland GmbH. Adenauerstr. 20/A4 D-52146 Wuerselen, Germany
MALAYSIA	support@zyxel.com.my sales@zyxel.com.my	+603-795-44-688 +603-795-34-407	www.zyxel.com.my	Lot B2-06, PJ Industrial Park, Section 13, Jalan Kemajuan, 46200 Petaling Jaya Selangor Darul Ehasn, Malaysia

Table of Contents

Copyright.....	ii
Federal Communications Commission(FCC) Interference Statement.....	iii
Information for Canadian Users.....	iv
ZyXEL Limited Warranty	v
Customer Support.....	vii
List of Figures.....	x
List of Tables.....	x
Preface.....	xi
Chapter 1 Getting to Know Your ZyAIR 100.....	1-1
1.1 Introduction	1-1
1.2 Features of the ZyAIR 100	1-1
1.3 Applications.....	1-2
Chapter 2 Hardware Installation	2-1
2.1 System Requirements	2-1
2.2 Installing the ZyAIR 100.....	2-1
Chapter 3 Software Installation.....	3-1
3.1 Windows® 95 (OSR2)/98/ME Setup	3-1
3.2 Windows® NT 4.0 Setup	3-6
3.3 Windows® 2000 Setup.....	3-11
3.4 Windows® XP Setup.....	3-12
3.5 Software Installation Complete	3-16
Chapter 4 Utility Setup and Configuration	4-1
4.1 Utility Setup	4-1
4.2 Utility Configuration	4-2
4.2.1 Utility Screen.....	4-3
4.2.2 Configuration.....	4-3
4.2.3 Loop Back	4-8
4.2.4 Access Points Browser	4-9
4.2.5 Site Survey	4-10
Chapter 5 Troubleshooting.....	5-1

Problems During Driver Installation 5-1

Problems With the Utility Configuration 5-2

Problems With Access Point Settings 5-2

Problems Communicating With the Computer 5-3

Appendix A Network Configuration..... A

Appendix B Hardware Specifications D

Appendix C Important Safety Instructions E

Index G

List of Figures

Figure 2-1 Inserting the ZyAIR 100 into Notebook Computer.....	2-2
Figure 4-1 Utility - Configuration	4-3
Figure 4-2 Utility - WEP Encryption	4-4
Figure 4-3 Utility - Advanced Configuration	4-6
Figure 4-4 RTS Threshold	4-7
Figure 4-5 Utility - Loop Back	4-9
Figure 4-6 Utility - Access Point Browser.....	4-10
Figure 4-7 Utility - Site Survey	4-11

List of Tables

Table 4-1 ZyAIR 100 Utility - Access Point Browser Screen Menu Fields.....	4-10
Table 5-1 Troubleshooting Installation of Your ZyAIR 100.....	5-1
Table 5-2 Troubleshooting Configuration.....	5-2
Table 5-3 Troubleshooting Settings for the Access Point.....	5-2
Table 5-4 Troubleshooting Communication Problems.....	5-3

Preface

About Your ZyAIR 100

Congratulations on your purchase of the ZyAIR 100 Wireless PC Card.



Online Registration

Do not forget to register your ZyAIR 100 (fast, easy online registration at www.zyxel.com) for free future product updates and information.

With a built-in Access Point and powerful routing features of the Prestige series models, you can place a wireless Prestige anywhere on a local network and create a wireless infrastructure for real-time database access, file sharing, email, printer sharing, and fast Internet access. A mobile investment saves your office construction costs, maintenance, and scalability because it's easy to add nodes. A mobile office can dramatically increase the office efficiency. The ZyAIR 100 is designed for:

- ☐ Home offices and small businesses with cable, DSL and wireless modem.
- ☐ Wireless LAN connectivity: allows you to work anywhere in the coverage area.
- ☐ Multiple office/department connections via access devices.
- ☐ E-commerce/EDI applications.

Your ZyAIR 100 is easy to install and to configure.

About This User's Guide

This user's guide is designed to guide you through the hardware and software installation of your ZyAIR 100 for its various applications.

Regardless of your particular application, it is important that you follow the steps outlined in **Chapters 2** and **3**. You can then refer to the appropriate chapters of the user's guide, depending on your application.

Related Documentation

- Supporting Disk
More detailed information and examples can be found in our included disk (as well as on the zyxel.com web site). This disk contains information on configuring your ZyAIR 100, Application Notes and Troubleshooting.
- Quick Start Guide

Our Quick Start Guide is designed to help you get up and running right away. It contains a detailed easy-to-follow setup steps, default settings, handy checklists and information on setting up your network using the ZyAIR 100 utility.

➤ Glossary

Please refer to www.zyxel.com for an online glossary of networking terms.

➤ ZyXEL Web Site

The ZyXEL download library at www.zyxel.com contains additional support documentation.

Syntax Conventions

- “Type” means for you to type one or more characters and press the carriage return. “Select” or “Choose” means for you to select one predefined choices.
- Command and arrow keys are enclosed in square brackets. [ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar.
- For brevity’s sake, we will use “e.g.,” as a shorthand for “for instance”, and “i.e.,” for “that is” or “in other words” throughout this manual.
- The ZyAIR 100 Wireless PCMCIA Card may be referred to as the ZyAIR 100 or the ZyAIR in this user’s guide.

Part I:

GETTING STARTED

Chapters 1 to 3 are structured as a step-by-step guide to help you connect, install and setup your ZyAIR 100 to operate on your notebook computer.

Chapter 1

Getting to Know Your ZyAIR 100

This chapter introduces the main features and applications of the ZyAIR 100.

1.1 Introduction

The ZyAIR 100 is an 11 Mbps IEEE 802.11(b) Wireless PC Card and that has a standard PCMCIA adapter which fits into any standard PCMCIA Type II notebook computer slot. Its 11 Mbps data rate gives equivalent Ethernet speed to access corporate networks or the Internet in a wireless environment. The ZyAIR 100 gives you the mobile continence to communicate with any 802.11 and 802.11b-compliant product, allowing you to stay connected anywhere within a coverage area.

1.2 Features of the ZyAIR 100

The following are the essential features of the ZyAIR 100.

- Supports Data Rate of 1, 2, 5.5 and 11 Mbps
- Ranges up to 800 feet in an open environment
- Supports Point-to-Point and Point-to-Multi-point Access
- Seamless connectivity to wired Ethernet and computer Network LAN
- Helps to Augment Existing Networks Quickly and Easily
- Direct Sequence Spread Spectrum (DSSS) technology provides robust, interference-resistant and secure wireless connections
- Wireless connectivity minus the cost of cabling
- Supports, Windows® DOS/95/98/NT4.0/2000/XP
- Supports Plug and Play
- Ease of installation
- Flexibility and mobility to locate or move networked computers

1.3 Applications

The ZyAIR offers fast, reliable and cost-effective solutions for wireless networks. They include:

- Remote Access to Corporate Network Information
For email, file transfer and terminal emulation access.
- Difficult to Wire Environments
For use in historical or old buildings, asbestos installations and open areas where wiring is impossible to deploy.
- Frequently Changing Environments
For retailers, manufacturers and those who frequently rearrange the workplace or change location.
- Temporary LANs for Special Projects or During Peak Time
For trade shows, exhibitions and construction sites where a temporary network is required. For retailers, airline and shipping companies who need additional workstations during peak periods. For auditors requiring workgroups at customer sites.
- Access to Database for Mobile Users
Doctors, nurses, retailers who need to access their databases on the move in a hospital, retail store, office or campus.
- SOHO (Small Office and Home Office) Users
SOHO users who need easy and quick installation of a small computer network.
- High Security Connection
Flexible, secure and quick installations.

Chapter 2

Hardware Installation

This chapter shows you how to install the hardware.

2.1 System Requirements

- PCMCIA Type II slot
- PCMCIA card and socket service that is Revision 2.1-compliant to PCMCIA specification (or higher)
- Windows® 95 (OSR2)/98/NT 4.0/2000/ME/XP Operating System. (You must have the actual OS disk for Windows 95/98)
- 500 Kbytes free hard disk space (minimum) for driver and utility program installation.

2.2 Installing the ZyAIR 100

Follow the procedure shown next to install the ZyAIR 100. Please also see the **Appendices** for important safety instructions.

- Step 1.** Locate available Type II or Type III PCMCIA slot in your notebook computer.
- Step 2.** With the ZyAIR 100 adapter's 68-pin connector facing the PCMCIA slot and its label side facing up, slide the ZyAIR 100 completely into the PCMCIA slot as shown next.
- Step 3.** Go to the next chapter for more instructions on installing the driver.



Figure 2-1 Inserting the ZyAIR 100 into your Notebook Computer

The PCMCIA slot allows “hot swapping” of PCMCIA adapter, allowing you to insert or remove the ZyAIR 100 from the slot whenever you like even when power to your computer is on. However, you should always disable the ZyAIR 100 prior to card removal to allow Windows® to log off from the network server. Disable the ZyAIR 100 properly and disconnect power to the PC Card slot.

Chapter 3

Software Installation

This chapter shows you how to install the ZyAIR 100 driver for Windows® 95 (OSR2)/98/NT 4.0/2000/XP Operating Systems.

3.1 Windows® 95 (OSR2)/98/ME Setup

Before starting driver installation, make sure that the ZyAIR 100 has been inserted into a standard type II PCMCIA slot on your notebook computer.

- Step 1.** Insert the ZyAIR 100 into an available PCMCIA slot in your notebook computer. Windows® will auto-detect the ZyAIR 100 and displays **Add New Hardware Wizard** dialog box. Click **Next**.



Step 2. Select **Search for the best driver for your device** and then click **Next**.



Step 3. Insert the Support CD-ROM into the CD-ROM drive and specify the location of the driver, then click **Next**.



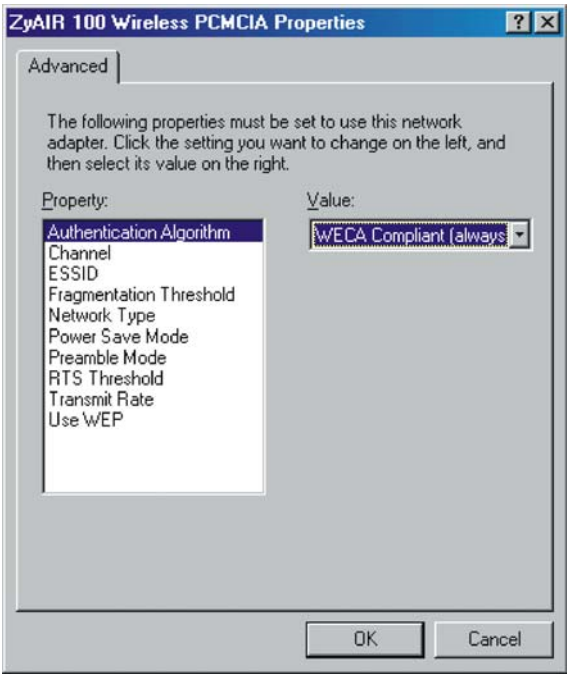
Step 4. Click **Next** to continue.



Step 5. Click **Next** to install the necessary driver.



Step 6. Select the parameters for the ZyAIR 100, then click **OK**. (Refer to the next chapter for parameter definitions).



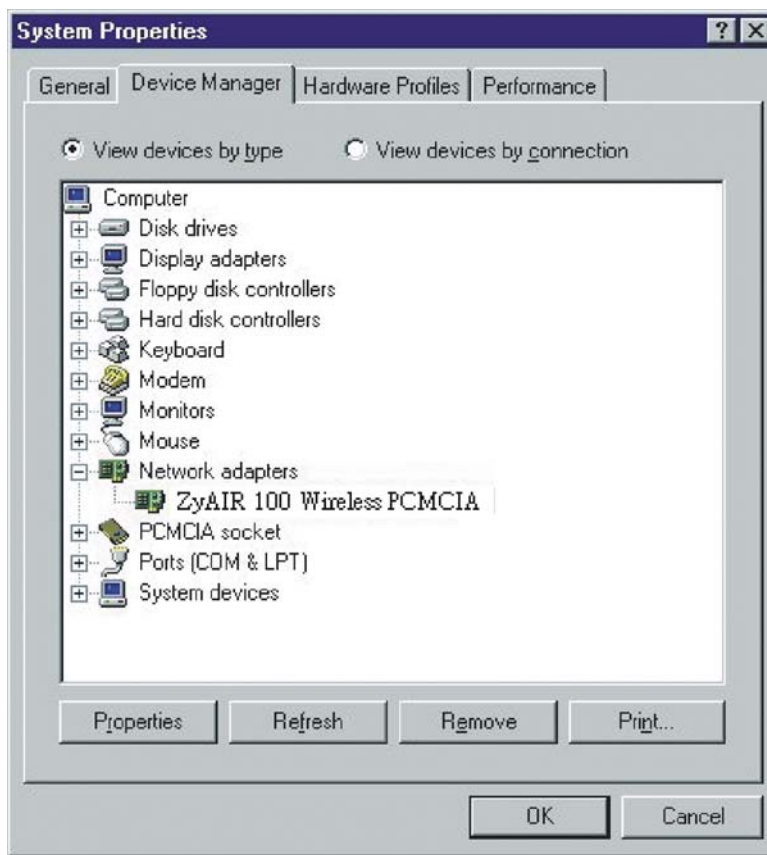
Step 7. Click **Finish**.



Step 8. Click **Yes** to restart your computer.



Step 9. Click **Start**, then **Control Panel**, **System** and then the **Device Manager** tab. Double-click **Network Adapters**. If no error icon appears, then your ZyAIR 100 has been successfully installed. If you see an error message, then refer to the **Troubleshooting** section.



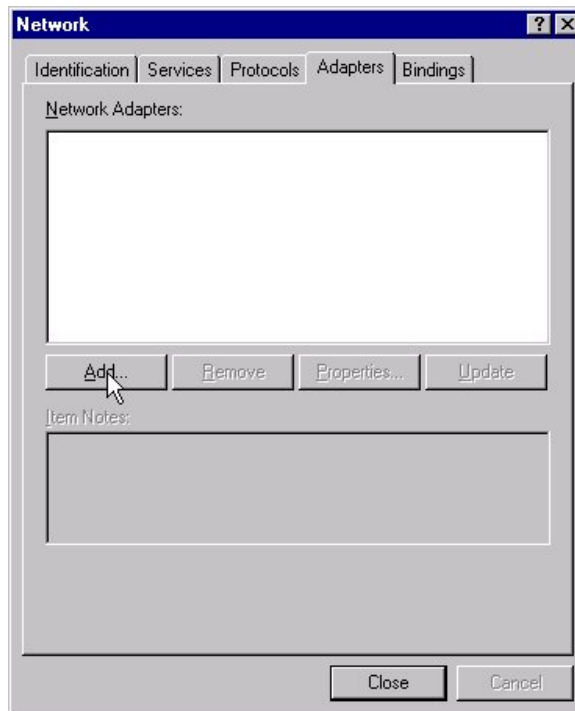
Step 10. Click **OK**.

3.2 Windows® NT 4.0 Setup

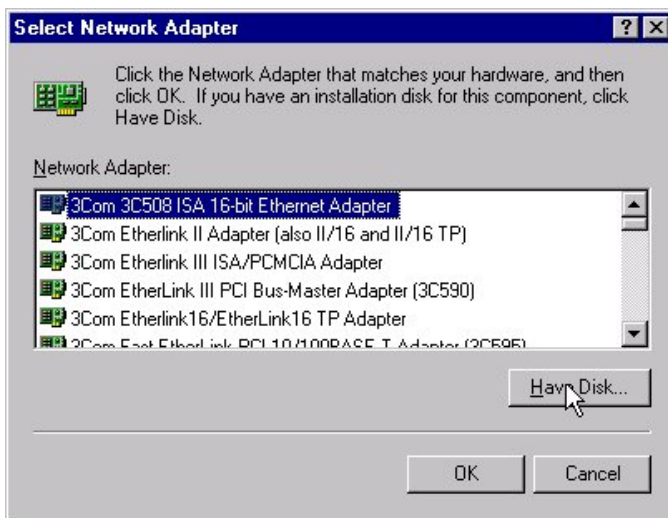
Before starting driver installation, make sure that the ZyAIR 100 has been inserted into a standard type II PCMCIA slot on your notebook computer.

Step 1. Login as **Administrator**.

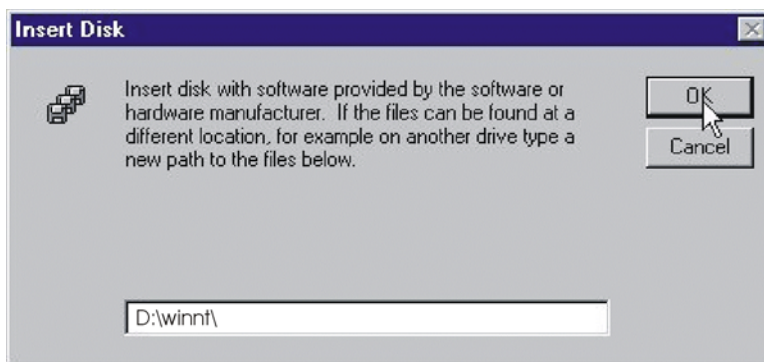
Step 2. Click **Start**, then **Control Panel**. Double-click **Network** click on the **Adapters** tab and then click **Add**.



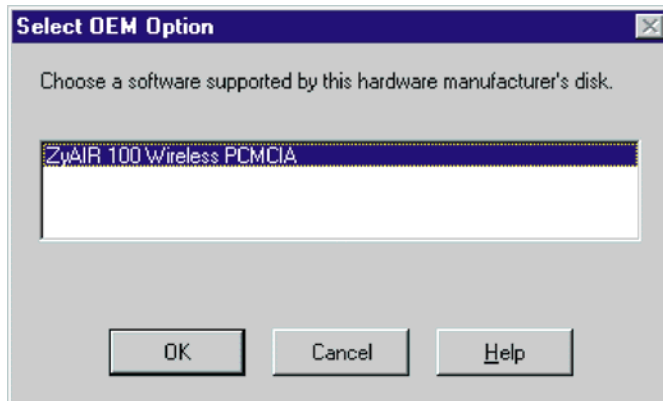
Step 3. Select **Others**, or click **Have Disk**.



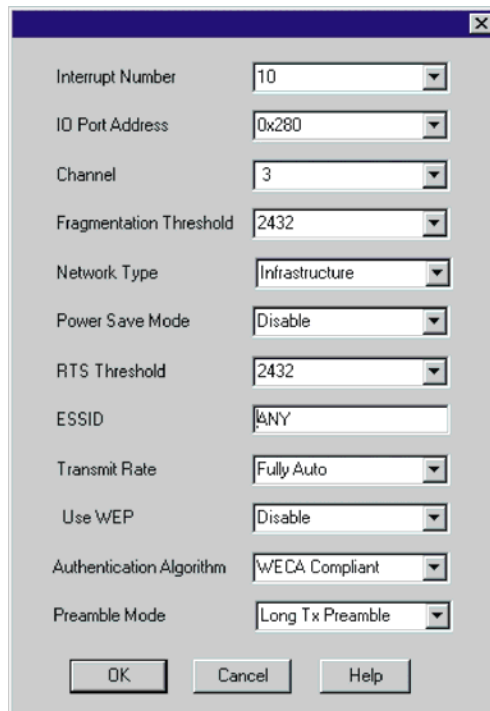
Step 4. Insert the Support CD-ROM into the CD-ROM drive and specify the location of the driver.



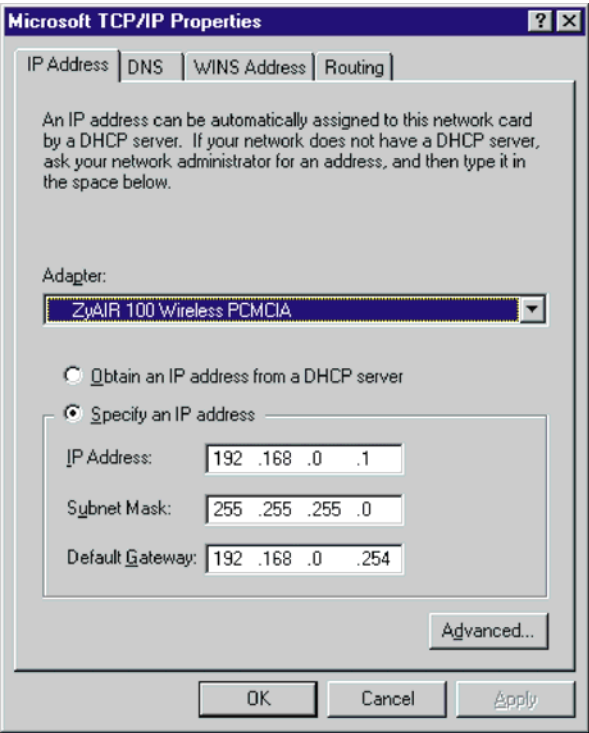
Step 5. Click **OK**. Windows will attempt to locate the **INF** file in the path specified. If you have entered the path correctly, Windows will copy the appropriate drivers onto your computer.



- Step 6.** In the ZyAIR 100 setup select the appropriate **Channel**, **Network Type** and **ESSID** manually according to the default setting in the next figure. You may change it later according to your needs. Click **OK** to continue.



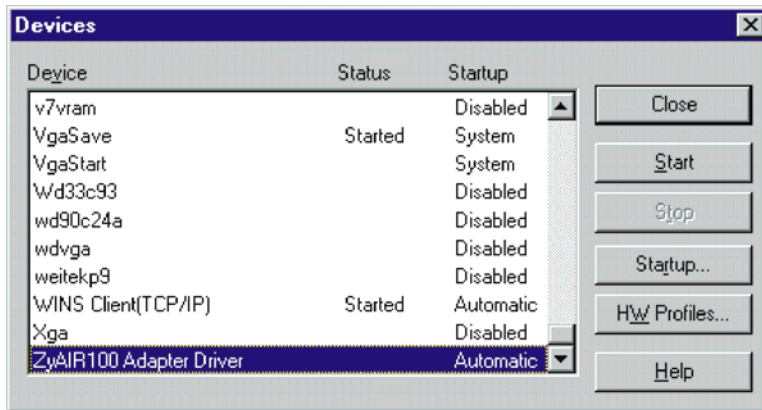
Step 7. Click **Start**, then **Control Panel**. Double-click **Network**, click on the **Adapters** tab, then click **Properties**. Specify each parameters required for the network to operate on such as **IP Address**, **Subnet Mask** and **Default Gateway**.



Step 8. Click **Yes** to restart your computer.

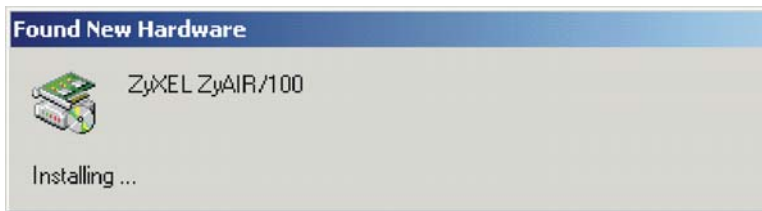


- Step 9.** To find out if the ZyAIR 100 is functioning properly, click **Start**, then **Control Panel**. Double-click **Devices**. Your ZyAIR 100 is working if **Automatic** is shown in the **Startup** column. Click **Close** to exit.

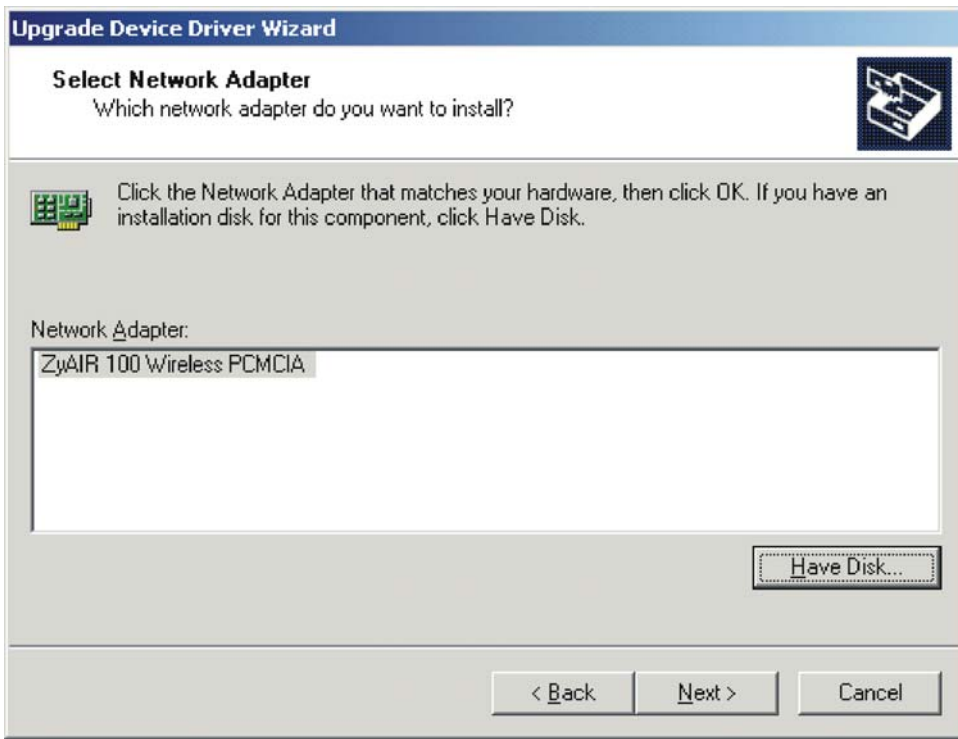


3.3 Windows® 2000 Setup

- Step 1.** Insert the ZyAIR 100 into the PCMCIA slot of your computer. Windows® will auto-detect the new hardware and displays **Found New Hardware** dialog box and then the **Upgrade Device Driver Wizard**.



- Step 2.** Insert the Support CD-ROM into the CD-ROM drive and click **Have Disk**. Specify the location of the driver.



Step 3. Follow the on screen instructions to complete driver installation.

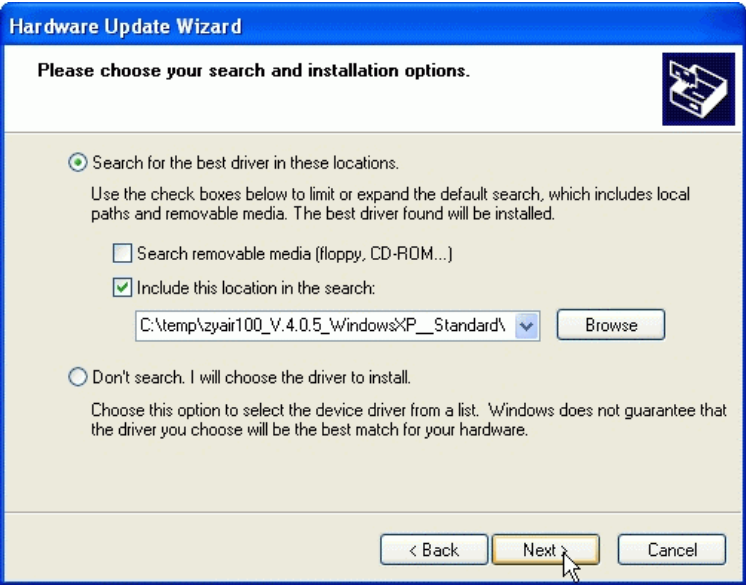
Restart your computer when you are prompted to do so.

3.4 Windows® XP Setup

Step 1. Insert the ZyAIR100 into the PCMCIA slot on your notebook. Windows XP will auto-detect the ZyAIR 100 and displays the **Found New Hardware Wizard** dialogue. Select **Install from a list or specific (Advanced)** and click Next.



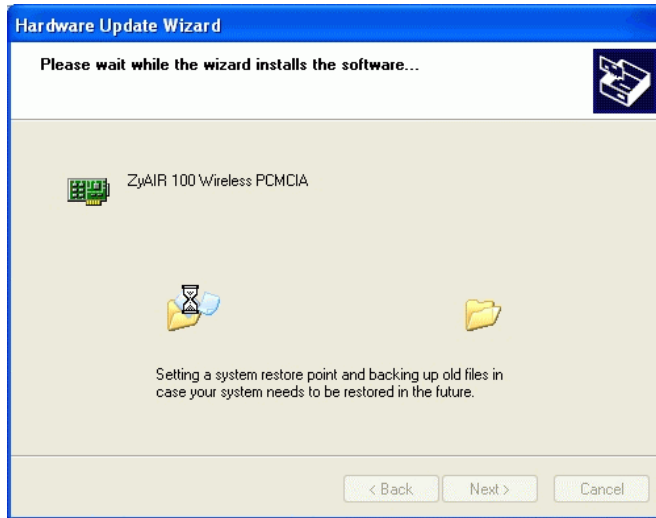
Step 2. Insert the Support CD-ROM into CD-ROM drive. Specify the location of the driver. Click **Next**.



Step 3. If you encounter the following warning screen, click **Continue Anyway** .



- Step 4.** Windows will detect the ZyAIR 100 and copy corresponding files onto your computer. Click **Next**.



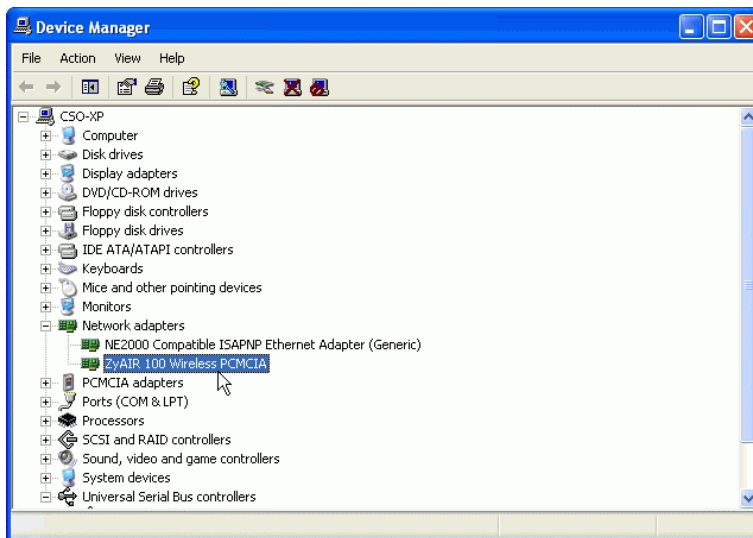
- Step 5.** Click **Finish**.



- Step 6.** After installing the ZyAIR 100, Windows XP displays a **Wireless Network Connection #** message.



- Step 7.** Click **Start, Control Panel, Performance and Maintenance, System, Hardware, Device Manager**. Click **Network Adapters**. If no error icon appears, your ZyAIR 100 is working.



3.5 Software Installation Complete

Well Done! You have successfully installed and set up your ZyAIR 100 to operate on your computer.

Part II:

ADVANCED MANAGEMENT

This part provides information on configuring parameters

Chapter 4

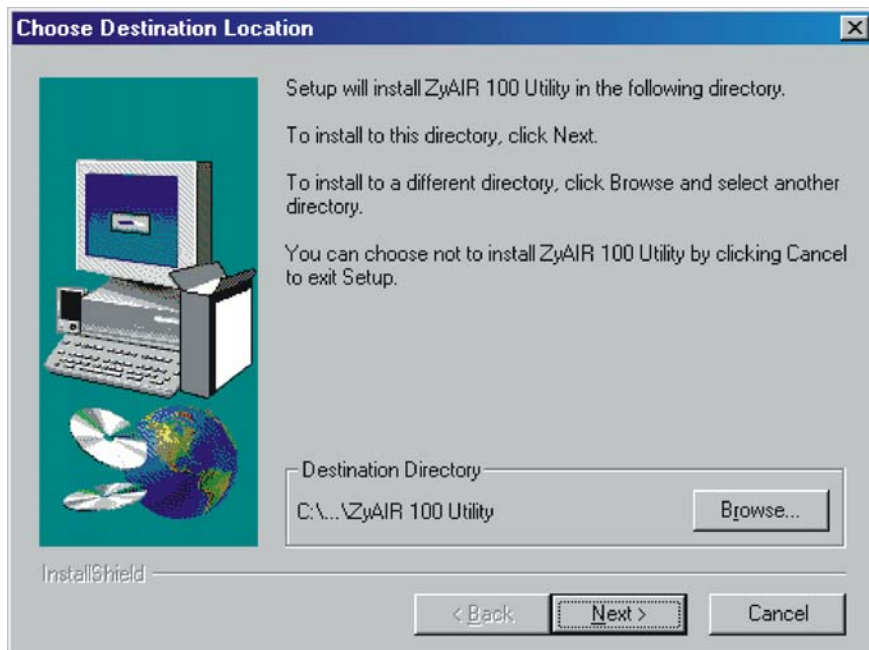
Utility Setup and Configuration

This chapter shows you how to install utility for ZyAIR 100.

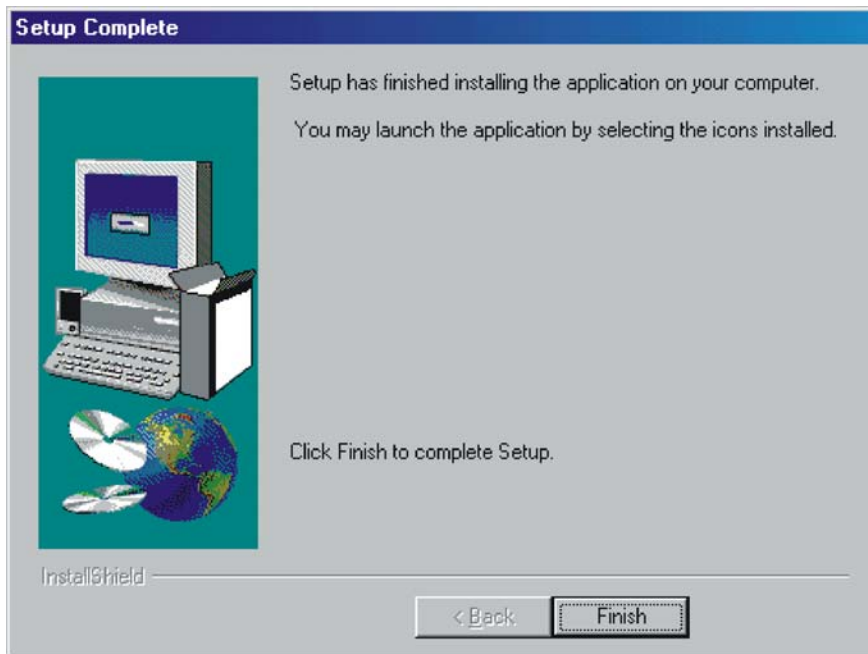
4.1 Utility Setup

Screen shots will vary depending on your version of Windows.

- Step 1.** Insert the Support CD-ROM into your CD-ROM drive and run the **setup.exe** file found in the **Utility** folder. Follow the on-screen instructions.



- Step 2.** Click **Finish** to complete the utility installation.



Step 3. Proceed to the next section to configure your ZyAIR 100.

4.2 Utility Configuration

Your ZyAIR 100 is Plug-and-Play and its default settings can be set for a typical infrastructure wireless LAN. Simply install the ZyAIR 100 onto your computer and it is ready for use. In special circumstances however, you may need to change configuration settings depending on how you want to manage your wireless network. The **ZyAIR 100 Utility** enables you to make configuration changes and perform user-level diagnostics.

Step 1. To run the utility for the first time, click **Start** and then **Programs**. Run the **ZyAIR 100 Utility**. The icon for the ZyAIR 100 appears in the system tray.

Step 2. Double click on the ZyAIR 100 Utility icon in the system tray to display the utility window as shown next.

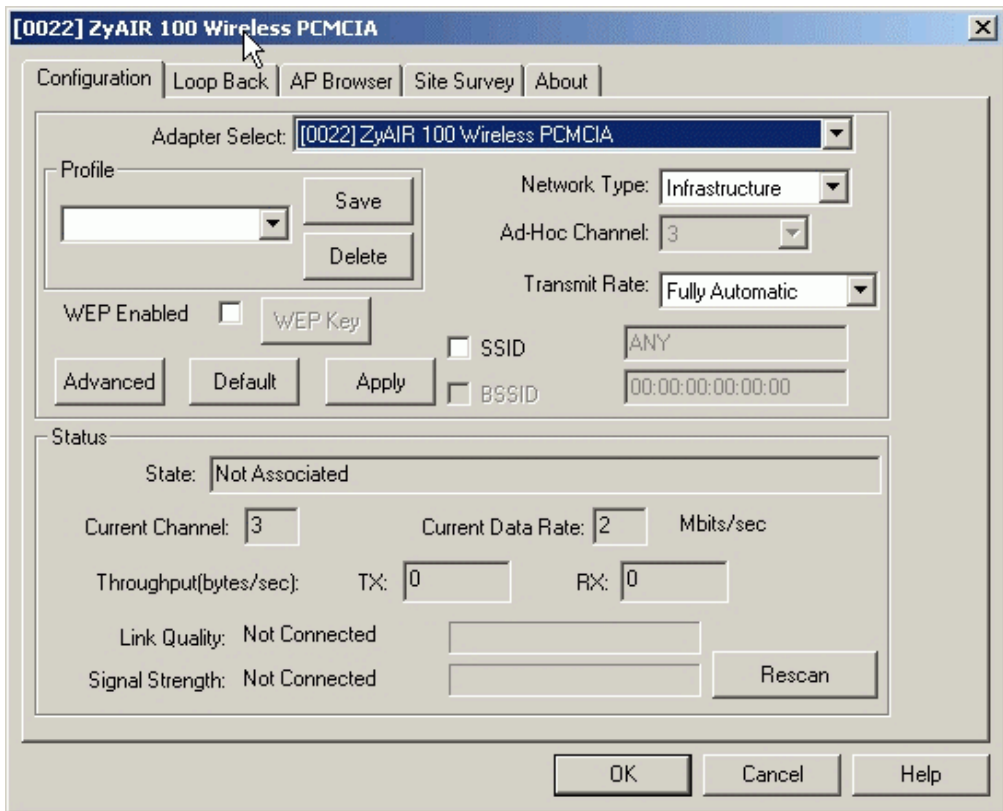


Figure 4-1 Utility – Configuration

4.2.1 Utility Screen

Configure and monitor your ZyAIR 100 using the following utilities: **Configuration**, **Loop Back**, **AP Browser**, **Site Survey** and **About**.

4.2.2 Configuration

The Configuration menu allows you to view and modify the current configurations of your ZyAIR 100 easily and quickly. The configuration settings include: **ESS ID**, **SS ID**, **Network Type**, **Use WEP** and **Transmission Rate**. Within the **Advanced** setting, you can set **Power Save**, **RTS** or **Frag Threshold**, **IRQ** and **I/O address**.

SS ID

The SSID is a unique ID given to the Access Point. Wireless clients associating to any Access Point must have the same SSID. Select **SSID** and enter a specific SSID (Access Point) you desire to connect with. Alternatively, you may not select the **SSID** (default setting). This allows your wireless adapter to automatically associate to any Access Point in the vicinity of your wireless adapters. You can leave **SSID** field blank, or enter **ANY** (all characters in uppercase). It is recommended that you select the **SSID** option. This will prevent your computer from accidentally connecting to a different wireless network.

When moving your computer to another location within the network environment and it becomes out-of-range of the current Access Point, the roaming function will automatically connect your computer to another Access Point.

Network Type

To connect your wireless station to a local network infrastructure, set the station operation mode to **Infrastructure (with Access Point)** as default setting). In case you do not wish to connect to a network infrastructure, but prefer to set up a small wireless workgroup, you can enable the **Ad-hoc (without Access Point)**. When the Ad-hoc mode is selected, be sure to set your wireless stations with the same channel.

ZyAIR 100 works with any IEEE 802.11 and 802.11(b)-compliant Access Points.

Transmission Rate

ZyAIR 100 provides various transmission (data) rate options for you to select. **Transmission Rate** options include **Fully Auto**, **Fixed 1 Mb/s**, **Fixed 2 Mb/s**, **Auto Select 1M or 2M**, **Fixed 5.5Mb/s** and **Fixed 11Mb/s**. In most networking scenarios, you will see that the factory default **Fully Auto** will prove the most efficient. This setting allows your ZyAIR 100 to operate at the maximum transmission (data) rate. When the communication quality drops below a certain level, ZyAIR 100 will automatically switch to a lower transmission (data) rate. Transmission at lower data speeds are usually more reliable. However, when the communication quality improves again, ZyAIR 100 will gradually increase the transmission (data) rate again until it reaches the highest available transmission rate.

If you wish to balance speed versus reliability, you can select any of the above options. **Fixed 11Mb/s** or **Fixed 5.5Mb/s** is used in a networking environment where you are certain that all wireless devices can communicate at the highest transmission (data) rate. **Fixed 1Mb/s**, **Fixed 2Mb/s**, **Auto Select 1M or 2M** are used often in networking environments where the range of the wireless connection is more important than speed.

Use WEP (Wired Equivalent Privacy)

To prevent unauthorized wireless stations from accessing data transmitted over the network, ZyAIR 100 offers highly secure data encryption known as WEP. If you require high security in transmission, please select **Enable** and click the **WEP Key** button.

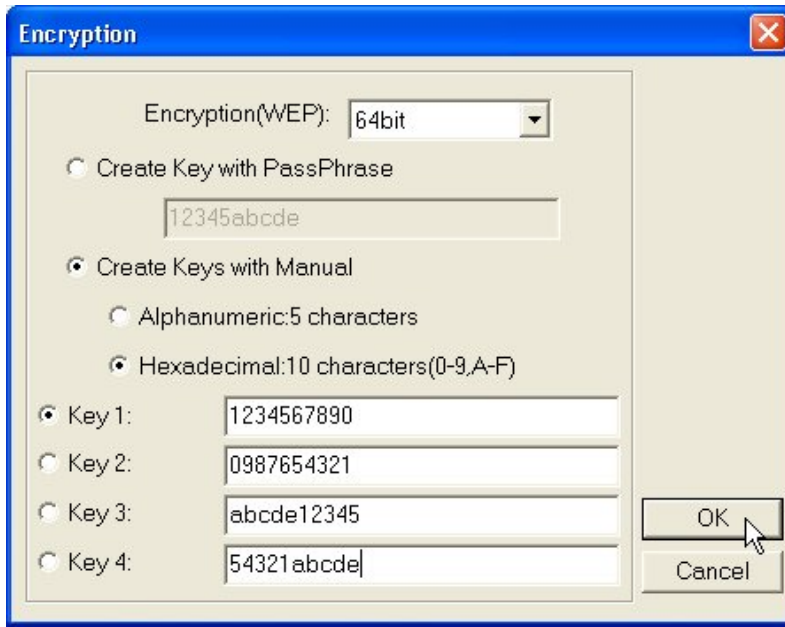


Figure 4-2 Utility – WEP Encryption

The **Encryption** dialog box enables you to identify four different encryption keys and select one of them to encrypt your transmission data. There are two methods to set the WEP keys as described:

Create Encryption Keys by Using a Passphrase

To create encryption keys by using a passphrase, Select either the **64bit** or **128bit** encryption first and then select **Create Key with Passphrase** and type a character string in the **Create Key with Passphrase** field. As you type, the utility uses an algorithm to generate four keys automatically. Select one of the four WEP keys and click **OK**. Then click the **Apply** button on the **Configuration** tab to make the setting take effect.

Create Encryption Keys Manually

You can also create up to four encryption keys manually by selecting **Create Keys Manually**.

For 64bit encryption you may choose:

- **Alphanumeric: 5 characters** (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (e.g. MyKey)
- **Hexadecimal: 10 hexadecimal digits** in the range of “A-F”, “a-f” and “0-9” (e.g. 11AA22BB33)

For 128bit encryption you may choose:

- **Alphanumeric: 13 characters** (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (e.g. MyKey12345678)
- **Hexadecimal: 26 hexadecimal digits** in the range of “A-F”, “a-f” and “0-9” (e.g. 00112233445566778899AABBCC).

After entering the WEP keys in the key field, select one key as an active key, click **OK** and then click **Apply** to make the setting take effect.

To allow encrypted data communications, you must set the same encryption key values on all wireless stations and/or Access Points. For example, if you use Key 1 on your ZyAIR 100 and the value is (e.g., MyCar), the same value must be assigned to Key 1 for all other client stations. The values you enter on the Encryption dialog box will only be visible the first time you enter the keys. After closing this dialog box, all Key values will be displayed as “xxxxxxxxxxxx” every time the tab is displayed again.

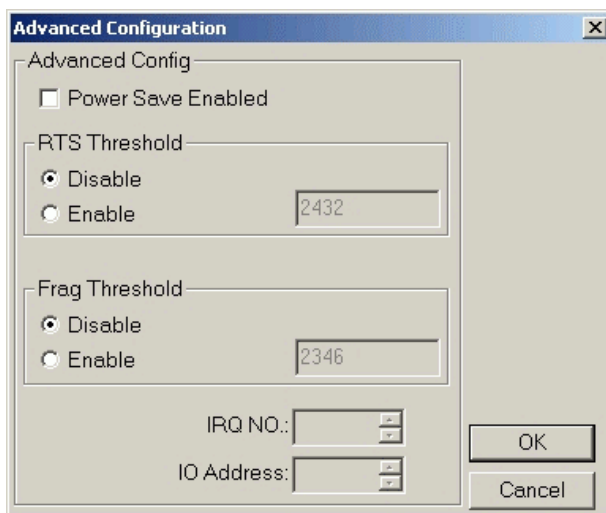


Figure 4-3 Utility – Advanced Configuration

Power Save

The **Power Save** function is used to conserve the battery life of your computer. When Power Save is enabled, your ZyAIR 100 will go into sleep mode to minimize power consumption.

The Power Save function is only supported in the Ad-hoc Network Type. The Infrastructure Network Type is supported in upcoming firmware upgrades. Please contact your reseller for the most recent firmware.

RTS Threshold

The **RTS Threshold** prevents the **Hidden Node** problem. **Hidden Node** is a situation in which two stations are within range of the same Access Point, but are not within range of each other. The following figure illustrates an example of the **Hidden Node** problem. Both stations (STA) are within range of the Access Point, however, they cannot hear each other. Therefore, they are considered hidden nodes from each other. When a station starts data transmission with the Access Point, it might not notice that the other station is already using the wireless medium. When these two stations send data at the same time, they might collide when arriving simultaneously at the Access Point. The collision will most certainly result in a loss of messages for both stations.

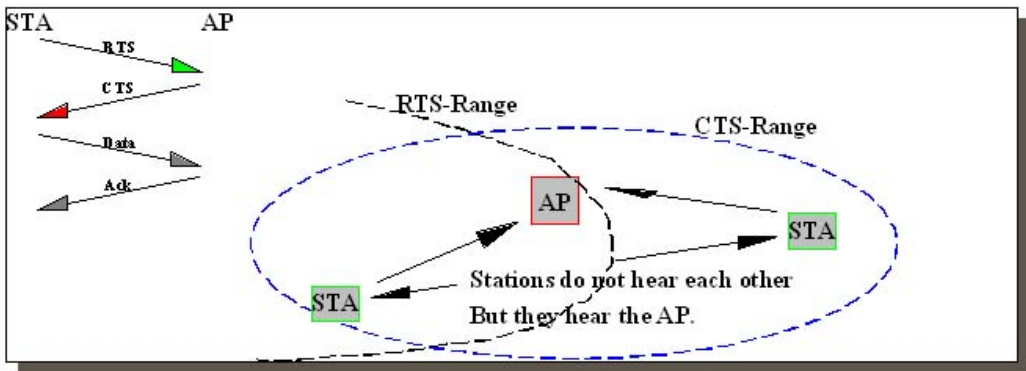


Figure 4-4 RTS Threshold

Thus, the **RTS Threshold** mechanism provides a solution to prevent data collisions. When you enable **RTS Threshold** on a possible **hidden station**, this station and its Access Point will use a Request to Send/Clear to Send protocol (RTS/CTS). The station will send an RTS to the Access Point, informing that it is going to transmit the data. Upon receipt, the Access Point will respond with a CTS message to all stations within its range to notify all other stations to defer transmission. It will also confirm with the requesting station that the Access Point has reserved it for the time frame of the requested transmission.

Normally, the **Disable** option (default) is selected when you are not concerned with the **Hidden Node** problem. When the **Hidden Node** problem becomes an issue, please select **Enable** and specify the packet size. The RTS function will be activated if the packet size exceeds the value you set. It is highly recommended that you set the value ranging from **0** to **2432**.

Enabling the RTS Threshold causes redundant network overhead that could negatively affect the throughput performance instead of providing a remedy.

Frag Threshold

Fragmentation improves the efficiency when high traffic flows along in the wireless network. If your ZyAIR 100 often transmits large files in the wireless network, you can enable the **Fragmentation Threshold** by clicking **Enable** in **Advanced Configuration** window and the function will split the packet. The value can be set from **256** to **2432**. **Frag Threshold** is set to **Disable** by default.

4.2.3 Loop Back

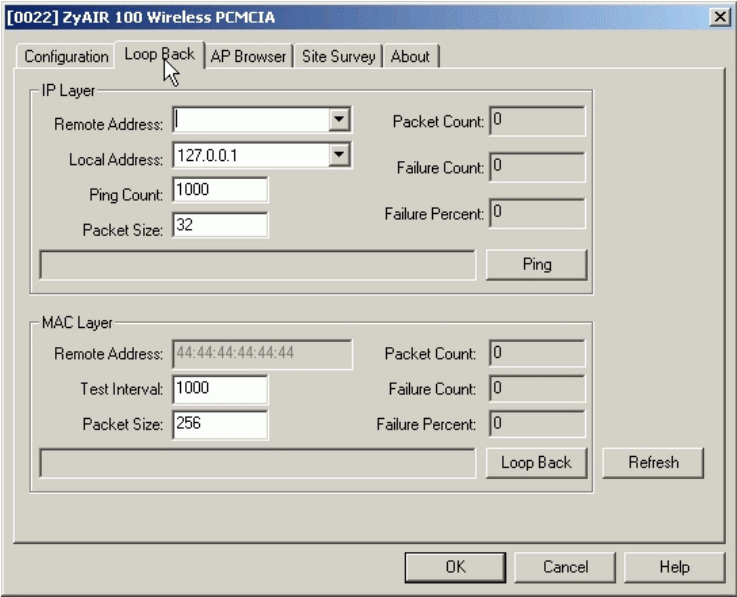


Figure 4-5 Utility – Loop Back

The **Loop Back** examines data transmission quality between your ZyAIR 100 and any computer on the network. By entering IP address of two remote station, setting ping interval and packet size, you may know whether communication has been made successfully or not. You may also run the loopback test by

clicking the **Loop back** button to verify the communication quality between your wireless station and Access Point. The **Refresh** button sets the counters back to zero.

4.2.4 Access Points Browser

Click **AP (Access Point) Browser** to display the status of all the active Access Points.

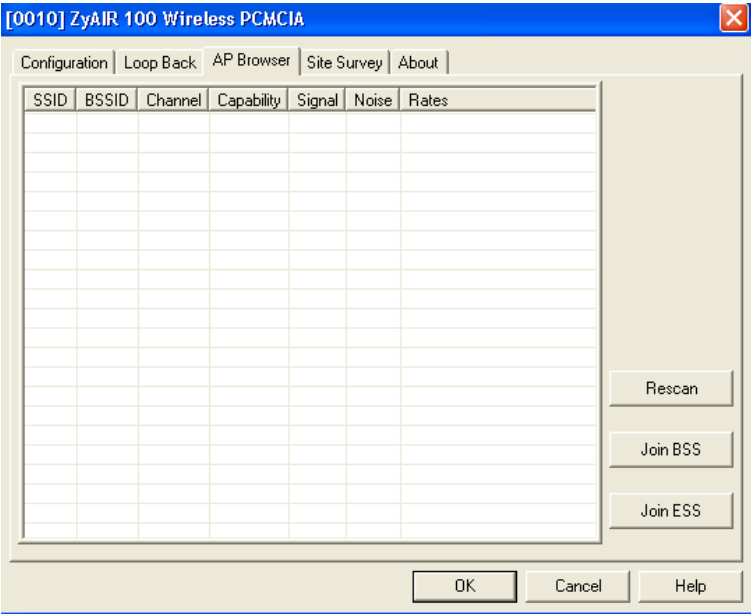


Figure 4-6 Utility – Access Point Browser

The following table explains the status/statistical information found in the **Access Point Browser** screen.

Table 4-1 Utiltity – Access Point Browser Screen Menu Fields

ITEM	DESCRIPTION
SS_ID	The SS ID (Service Set ID or MAC address) of the Access Point.
BSS_ID	The BSS ID (Basic Service Set ID) of the Access Point.
Channel	The operating channel of the respective Access Point.
Capability	When communicating with any Access Point, it will display BSS . This means that the Access Point is in the Infrastructure mode. When the device is in Ad-hoc mode, no information appears in this column.
Signal	The signal level is in the range of 27 to 154 . A high number indicates a strong signal. This information is for technician's use only.
Noise	This measures the actual amount of noise within your area. There may be situations where you are close to your Access Point but your signal is low. This may indicate a high noise level. This information is for technician's use only.
Rates	The data rates that ZyAIR 100 supports.

4.2.5 Site Survey

Use **Site Survey** to view the channel quality of all 14 radio channels. The blue bar indicates good channel quality. The higher the blue bar, the better the quality (for instance, less interference). The yellow indicates fair channel quality. The red bar indicates the channel is busy or having severe interference.

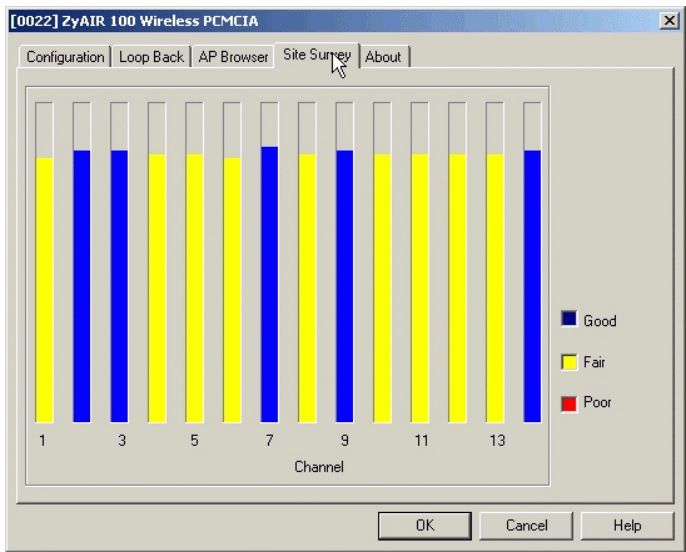


Figure 4-7 Utility – Site Survey

Part III:

ADDITIONAL INFORMATION

This part contains Troubleshooting, Appendices, and the Index.

Chapter 5

Troubleshooting

This chapter covers potential problems and the possible remedies. After each problem description, some instructions are provided to help you to diagnose and to solve the problem.

Problems During Driver Installation

Table 5-1 Troubleshooting the Installation of Your ZyAIR 100

PROBLEM	CORRECTIVE ACTION
The ZyAIR 100 is not working after the driver installation	<p>Insert the PCMCIA adapter into your notebook computer's slot again. The Power and Link LED should be on if the adapter is properly inserted.</p> <p>Check if the I/O and IRQ for the ZyAIR 100 has conflict problems with other devices connected to your computer. If there is a conflict, you need to set your I/O and IRQ manually.</p> <p>For Windows® 95 (OSR2)/98/NT/2000 operating system, make sure that the PCMCIA adaptor driver is installed on your computer.</p>
Windows does not auto-detect the ZyAIR 100	<p>Restart your computer.</p> <p>Do a manual scan of your computer hardware. In Windows 2000, click Start, Settings, Control Panel, System, Hardware, Hardware Wizard. In Windows XP, click Start, Control Panel, Performance and Maintenance, System, Hardware, Device Manager. Then Right-click on your computer name and select Scan for Hardware Changes.</p> <p>Check your PCMCIA adapter and make sure there is no hardware conflict.</p> <p>Return your card to vendor for maintenance.</p>

Problems With the Utility Configuration

Table 5-2 Troubleshooting the Configuration

PROBLEM	CORRECTIVE ACTION
Problems encountered with the configuration.	<p>Click Loopback in the Loop Back window to check the link status with the Access Point it is associated with (Infrastructure mode).</p> <p>Click on the Site Survey tab to check whether there is high interference around the environment.</p> <p>Ensure that you have set the correct IP address for the ZyAIR 100. Use the Ping command to ping the unit itself.</p> <p>Netbeui must be installed and relevant parameters properly set. Double-click Network Neighborhood on your Windows® desktop. You should see your computer name.</p>

Problems With Access Point Settings

Table 5-3 Troubleshooting the Settings for the Access Point

PROBLEM	CORRECTIVE ACTION
Problems with Access Point settings.	<p>Make sure that the Access Point is on and that all the LEDs are working properly.</p> <p>Click Ping in Loop Back window to ping any other host. If the host does not respond, your Access Point might not be connected to the network.</p> <p>Re-configure and reset the Access Point.</p> <p>Use the Web Manager or Telnet to the Access Point to make sure all Access Points are connected to the network.</p>

Problems Communicating With the Computer

Table 5-4 Troubleshooting Communication Problems

PROBLEM	CORRECTIVE ACTION
The ZyAIR 100 client cannot communicate with the other computer in the Ethernet when the Infrastructure mode is configured.	<p>Make sure that the Access Point and associated computer are on.</p> <p>Use the Site Survey utility to verify operating radio channel has low interference. Change the Access Point and all the stations within the BSS to another radio channel if interference is high.</p> <p>Make sure that the computer and Access Point share the same security option.</p> <p>Make sure that the BSS ID is the same as the Access Point for a roaming-disabled station. Make sure the SS ID is the same as the Access Point for a roaming-enabled station.</p>
Site Survey utility shows all channels at high interference (red bars)	<p>Move your computer closer to the Access Point within the transmission range.</p> <p>There are too many wireless clients. Stop or turn off any unnecessary wireless clients.</p>

Appendix A

Network Configuration

The ZyAIR 100 supports the same network configuration options of Legacy Ethernet LANs as defined by the IEEE 802 standard. The ZyAIR 100 can be configured as:

- Ad-hoc for departmental or SOHO LANs.
- Infrastructure for enterprise LANs.
- LAN-interconnection for point-to-point link as a campus backbone.

Ad-hoc Wireless LAN Topology

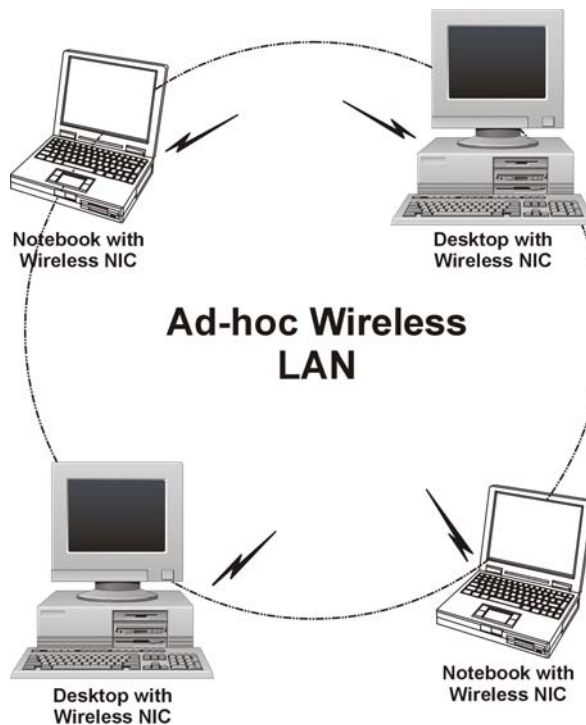


Diagram 1 Ad-hoc Wireless LAN Example

An Ad-hoc wireless LAN is a group of computers, each equipped with one wireless adapter, and connected as an independent wireless LAN. Computers in a specific Ad-hoc wireless LAN must be configured on the same radio channel. An Ad-hoc wireless LAN is available at a departmental scale for a branch or SOHO operation.

Wireless LAN Topology Infrastructure

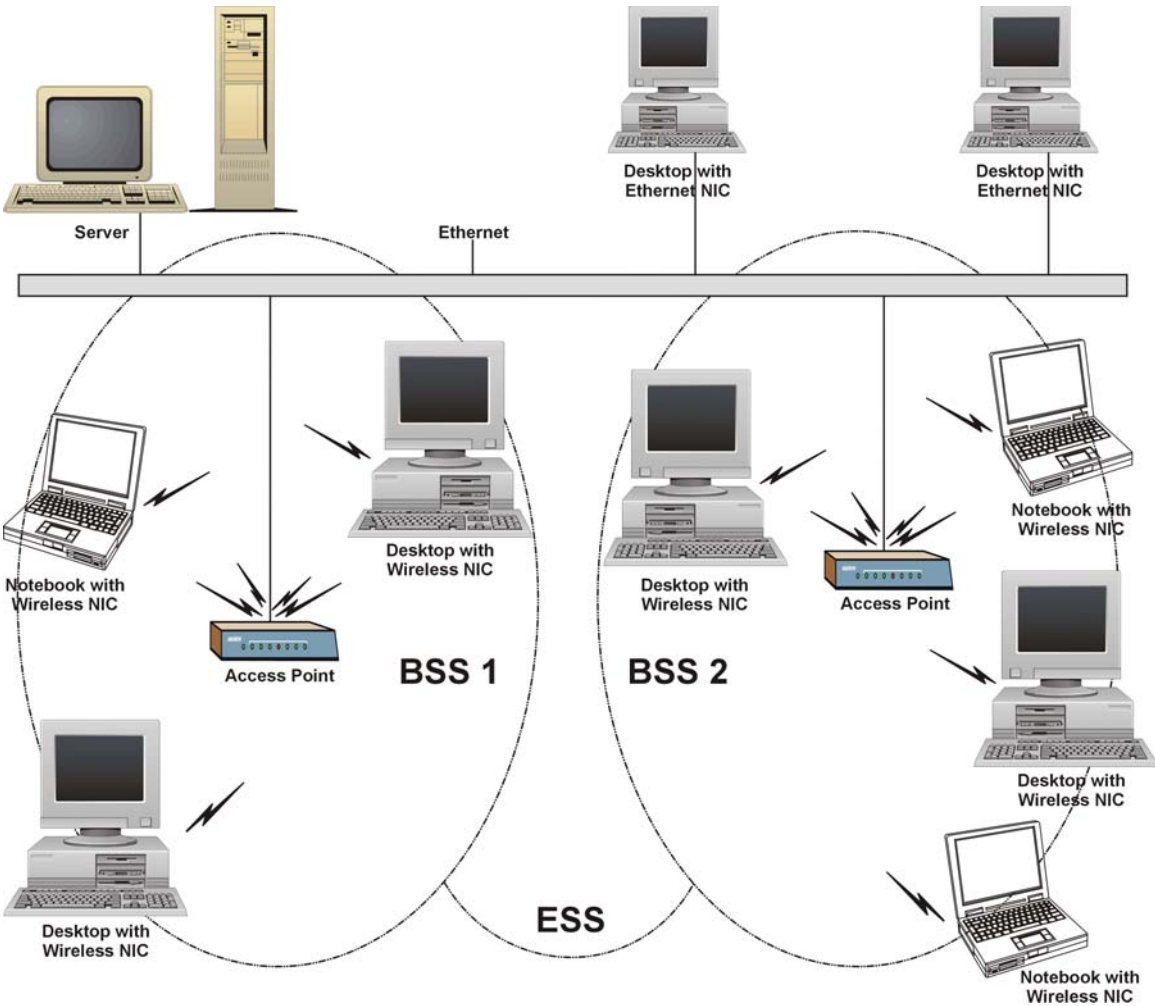


Diagram 2 Wireless LAN Infrastructure Example

The ZyAIR 100 provides access to a wired LAN for wireless computers. An integrated wireless and wired LAN is called an Infrastructure configuration. A group of wireless LAN computer users and an Access Point constitute a Basic Service Set (BSS). Each wireless-equipped computer in this BSS can talk to any computer in the wired LAN infrastructure via the Access Point.

Infrastructure configuration will extend the accessibility of a wireless station to the wired LAN. Multiple Access Points will allow roaming and it will increase the transmission range. The Access Point is also able to forward data within its BSS. The effective transmission range in an Infrastructure LAN is doubled.

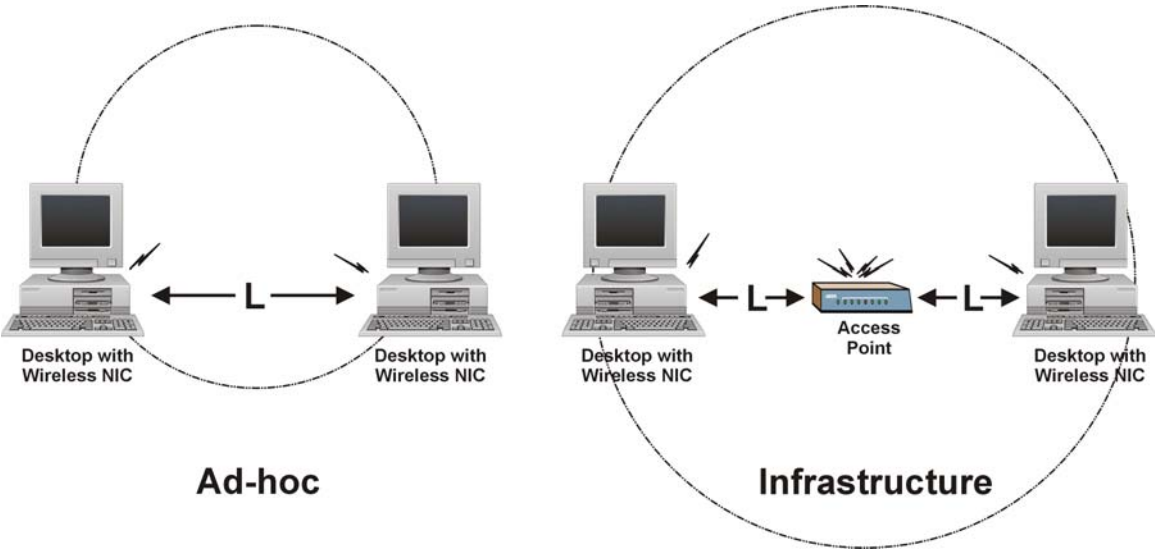


Diagram 3 Effective Transmission Range Example

Appendix B

Hardware Specifications

Diagram 4 ZyAIR 100 Specifications

PRODUCT	FEATURES
Operating Channels	11 for North America, 14 for Japan, 13 for Europe (ETSI), 2 for Spain, 4 for France
Operating Frequency	2.412 ~ 2.462 GHz (North America) 2.412 ~ 2.484 GHz (Japan) 2.412 ~ 2.472 GHz (Europe ETSI) 2.457 ~ 2.462 GHz (Spain) 2.457 ~ 2.472 GHz (France)
Range	11 Mbps: 460 feet = 140m (in an open environment) 5.5 Mbps: 656 feet = 200m 2 Mbps: 885 feet = 270m 1 Mbps: 1311 feet = 400m
RF Technology	Direct Sequence Spread Spectrum
Modulation	CCK (11 Mbps, 5.5 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps)
Voltage	3.3V and 5V DC
Power Consumption	Tx power consumption: < 350mA Rx power consumption: < 250mA Sleep Mode: 17mA
Output Power	13 dBm
Sensitivity	@PER < 0.08 11 Mbps < -83 dBm 5.5 Mbps < -86 dBm 2 Mbps < -89 dBm 1 Mbps < -91 dBm
Data Rate	1, 2, 5.5, 11 Mbps
Media Access Protocol	CSMA/CA, 802.11-compliant
Supported O/S	Windows® 95 (OSR2)/98/ME/2000/NT4.0/XP

Appendix C

Important Safety Instructions

The following safety instructions apply to the ZyAIR 100:

1. Be sure to read and follow all warning notices and instructions.
2. Do not service the product by yourself. Refer all servicing to qualified service personnel.
3. Generally, when installed after the final configuration, the product must comply with the applicable safety standards and regulatory requirements of the country in which it is installed. If necessary, consult the appropriate regulatory agencies and inspection authorities to ensure compliance.
4. A rare condition can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate building are interconnected, the voltage potential can cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and if necessary, implement corrective action before interconnecting the products. If the equipment is to be used with telecommunications circuit, take the following precautions:
 - Never install telephone wiring during a lightning storm.
 - Never install telephone jacks in wet location unless the jack is specially designed for wet location.
 - Never touch non-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
 - Use caution when installing or modifying telephone lines (other than a cordless telephone) during an electrical storm. There is a remote risk of electric shock from lightning
5. In order to limit Radio Frequency (RF) exposure, the following rules should be applied:
 - Install the antenna in a location where a distance of 20 cm from the antenna may be maintained.
 - While installing the antenna in the location, please do not turn on the power of wireless card.
 - While the device is working (transmitting or receiving), please do not touch or move the antenna.
 - Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment unless it is a type especially qualified for such use.
6. For Laptop (notebook) computer users, in order to comply with the FCC RF exposure limits, it is recommended when using a laptop with a wireless LAN adapter card that the card's integrated antenna should not be positioned closer than 5 cm (2 inches) from your body or nearby persons for extended periods of time while it is transmitting (or operating). If the antenna is positioned less than 5 cm (2 inches) from the user, it is recommended that the user limit exposure time.

Index

A

Access Point Setting Problem	5-2
Access Points Browser	4-9
Ad-hoc Topology	B

B

Basic Service Set	D
BSS	See Basic Service Set
BSS ID	4-10

C

Capacity	4-10
Channel	4-10
Operating	E
Clear to Send protocol	4-7
Communication Problem	5-3
Configuration Problem	5-2
Conflict problem	5-1
Connectivity	
Seamless	1-1
Wireless	1-1
CTS	See Clear to Send
Customer Support	vii

D

Data collision	4-7
Data encryption	4-4
Data rate	1-1
DSSST(Direct Sequence Spread Spectrum	
Technology)	1-1
Disk space required	2-1

E

ESS ID	4-4, 4-10
--------------	-----------

F

Features	1-1
Frag Threshold	4-8
Fragmentation function	4-8
Frequency	
Operating	E

H

Hardware Specifications	E
Hidden Node problem	4-7
Hot swapping	2-2

I

Infrastructure Topology	C
Inserting the ZyAIR 100	2-2
Installation	
Hardware	2-1
Software	3-1
Installation Problem	5-1

M

MAC address	4-10
Main Menu	4-3
Media Access Protocol	E
Modulation	E

N

Netbeui	5-2
Network Configuration	B
Network Type	4-4
Noise Level	4-10

O	Troubleshooting.....	5-1
O/S Supported.....	E	
P	V	
Parameter Configuration.....	Voltage	E
PCMCIA adapter	W	
PCMCIA slot	WEP	See Wired Equivalent Privacy
Power	WEP Encryption Screen	4-5
Ouput	Wired Equivalent Privacy.....	4-4
Power Consumption.....		
Power Save	Z	
Problem description	ZyAIR 100	
	Advantage.....	xi
R	Applications.....	1-2
Radio channel	Features	1-1
Radio Frequency (RF) exposure	ZyAIR 100 Utility	
Range	Setting Up.....	4-1
Working.....	Using	4-2
Rate		
Data.....		
Transmission.....		
Request to Send protocol		
RF Technology		
Roaming function		
RTS		See Request to Send
RTS Threshold.....		4-7
S		
Safety Instructions		F
Security in transmission.....		4-4
Sensitivity		E
Signal Level.....		4-10
Site Survey.....		4-10
Syntax Conventions of this Manual.....		xi
System Requirements		2-1
T		
Transmission Range		
Effective.....		D

